

Strategic Plan for the Restoration of Anadromous Fish to the Merrimack River

This document represents the scheduled revision of the Atlantic Salmon Strategic Plan (1990). The cooperating fisheries agencies have expanded the restoration program planning effort in several important ways. First, this Strategic Plan addresses the river herrings (alewife and blueback herring), and the American shad, in addition to the Atlantic salmon. Second, this plan proposes a holistic approach to anadromous fish restoration. This "watershed approach" recognizes the dynamic physical, biological, political and economical connectedness of the Merrimack River basin from its headwaters in the White Mountains to its confluence with the Gulf of Maine.

Measuring success will require a candid portrayal of expectations and agreement on whether the program results are ecologically, scientifically, economically, and politically acceptable.

This document will be updated in the year 2005. If changes in program direction or significant new information occur prior to 2005, updates may be required at an earlier date. The Strategic Plan still embodies the goal of restoring the Atlantic salmon to a self-sustaining level estimated at 1,900 multi-sea-winter females reaching the spawning grounds. Restoration of American shad and the river herrings is also directed at developing and maintaining self-sustaining populations to their historical habitat. Full restoration levels for the American shad and river herrings are unknown at this time because of insufficient life-history and habitat data. Within the planning period of this document it is unlikely that any of the target species will reach levels of self-sustainment. Cyclical fluctuations in marine survivals, ineffective upstream and downstream fish passage, and a host of additional factors make it impossible to predict accurately what population levels can be achieved through this restoration program. In light of this, the cooperating agencies have developed three interim objectives that are considered achievable within the next decade.

- I. An adult Atlantic salmon population that will exceed the sea run brood stock holding capacity of the Nashua National Fish Hatchery (300) and provide some level of reproduction in the wild.
- II. An annual average of 35,000 adult American shad passing the Essex fish-lift in Lawrence.
- III. An annual average of 300,000 adult river herring passing the Essex fish-lift in Lawrence.

Strategy 1: Implement a watershed approach to anadromous fish restoration.

1.A. Cooperate with local, state and federal agencies to maintain and restore aquatic habitat critical to anadromous fish restoration including water quality, water quantity, riparian condition, substrate quality, and adequate fish passage throughout the watershed, including the following:

1.A.1. Work with state, local and federal agencies to assure protection and enhancement of existing aquatic habitat in the basin.

- Identify, map and make available to agencies that regulate activities affecting aquatic habitat (discharge permits, road and bridge construction, bank stabilization activities, development proposals, water withdrawals), the location and importance of spawning and rearing habitat in the basin for the target species.
- Water Quality: work with Merrimack River Initiative and discharge permitting agencies (NH Department of Environmental Services, MA Department of Environmental Protection, US Environmental Protection Agency) to assure high water quality in the Basin.
- Water Quantity: work within appropriate regulatory processes (Federal Energy Regulatory Commission hydro licensing, 404 permits, , state 401 permits, Forest Service Special Use Permits, Water Management Act and Inter-basin Transfer Act for MA), and basin planning initiatives (NH and MA Rivers Protection Programs) to assure adequate instream flows for spawning and rearing habitat of target species.
- Substrates: work within appropriate regulatory processes to maintain low levels of percent fines in prime Atlantic salmon spawning and rearing habitat.
- Identify and prioritize riparian and aquatic habitat areas impacted by past or ongoing human disturbance, and explore opportunities for restoration.

1.A.2. Fish Passage: assure safe and effective upstream and downstream fish passage for all target species by monitoring the efficiency of fish passage facilities and implementing new measures or modifying existing projects as needed.

- Continue to work with Consolidated Hydro, Inc. and Public Service of New Hampshire to ensure that upstream passage at the Lawrence, Lowell and Amoskeag hydroelectric projects operate effectively to pass target species.
- Continue to work with Public Service of New Hampshire to ensure that smolt downstream passage at the Public Service of New Hampshire hydroelectric projects is pursued in accordance with the existing fish passage plan.

- Continue to work with Consolidated Hydro, Inc. to ensure that downstream passage issues at the Lawrence and Lowell hydroelectric projects are resolved effectively and in a timely manner.
- Continue to pursue the resolution of the downstream fish passage issues at those projects not included within existing fish passage agreements.
- Identify and evaluate potential downstream fish passage problems at specific sites where potential passage problems exist.

1.B. Identify and implement initiatives to restore stocks of target species.

1.B.1. Produce Atlantic salmon fry and smolts to meet program needs (currently projected at 4,000,000 fry and 200,000 smolts).

- Continue to evaluate the current fry stocking target.
- Maintain adult sea run salmon holding capability at the Nashua National Fish Hatchery.
- Maintain domestic broodstock production at the Nashua National Fish Hatchery to meet program needs.
- Maintain and utilize existing egg incubation capability at the North Attleboro National Fish Hatchery to meet program needs.
- Maintain and utilize existing capability at the Warren State Fish Hatchery to incubate eggs for the program.
- Maintain annual production of 50,000 yearling smolts at Green Lake National Fish Hatchery.
- Identify and implement measures to increase smolt production to meet the target of 200,000.
- Determine the desirability and feasibility for maintaining kelts or domestic broodstock at the North Attleboro National Fish Hatchery to assist in providing for a stable supply of eggs.

1.B.2. Develop a comprehensive adult salmon management plan for sea run salmon and domestic broodstock.

- Develop a management plan for the disposition of adult sea run salmon.
- Develop a management plan for the disposition of domestic broodstock.

1.B.3. Assess the American shad and river herring populations in the Merrimack River and develop plans for their restoration.

- Evaluate the shad and herring populations in the river.
- Identify, quantify and map shad and herring spawning and rearing habitat throughout the basin.
- Determine the need for and evaluate the effectiveness of intra-basin as well as inter-basin transfers of adult shad and river herring and continue and/or modify program as appropriate.
- Evaluate and pursue opportunities for providing fish passage to facilitate restoration of river herring into currently blocked habitat.
- Identify and quantify exploitation of adult shad and river herring within the Merrimack River Basin.
- Evaluate the feasibility of implementing fish cultural operations for American shad.

1.B.4. Evaluate the population effects of predation on target species.

1.B.5. Work towards the development of Merrimack River specific stocks of target species.

1.C. Monitor and evaluate the measurable components of the restoration program to guide modifications as needed.

1.C.1. Develop and implement an evaluation and monitoring plan to (1) continue basin wide estimates of fall parr abundance (tributary specific preferred), (2) obtain an annual basin wide smolt production index (tributary specific preferred), (3) determine timing of smolt migration within the Merrimack River watershed and (4) identify and quantify the sources of smolt mortality that occurs in the river and estuary.

1.C.2. Develop and implement a program for monitoring the quality of salmon spawning and rearing habitat.

1.C.3. Continue to provide for evaluation of the domestic broodstock releases (sport fishery, natural reproduction, fish movement, etc.) to maximize their benefit to the Merrimack River program.

1.C.4. Refine instream habitat evaluation to best use hatchery Atlantic salmon products (eggs, unfed fry, fry, parr, and smolts).

1.C.5. Monitor existing upstream and downstream fish passage facilities and modifications for efficiency in passing American shad, river herring, and Atlantic salmon.

1.C.6. Continue to support monitoring efforts proposed by the North Atlantic Salmon Conservation Organization, the Atlantic States Marine Fisheries Commission, other cooperators, agencies and organizations to evaluate oceanic habitat conditions, marine fisheries and their impact on the target species.

1.C.7. Develop and implement a program for monitoring the recreational fishery downstream from the Lawrence hydroelectric project.

Strategy 2. Continue to develop new and enhance existing partnerships with watershed stakeholders which maximize resources available for achieving program objectives.

2.A. Collaborate with other anadromous fish restoration programs and Merrimack River basin resource programs in order to exchange information and minimize duplication of efforts.

2.A.1. Seek ways to monitor and adjust management objectives that are based on state-of-the-art technologies and methodologies through collaboration with the research community.

2.B. Continue to encourage communication and information exchange with those agencies, regulatory bodies, and organizations having related jurisdictional interests and responsibilities.

2.B.1. Continue to support the reduction in the ocean fishery for Atlantic salmon and any monitoring that is proposed by North Atlantic Salmon Conservation Organization.

2.B.2. Provide technical input and assistance to other watershed resource planning efforts within the basin to assure objectives are compatible with and support anadromous fish restoration efforts.

2.C. Coordinate fish stocking with state agencies such that species known to be predaceous on juvenile salmon are not stocked in key restoration areas.

2.D. Develop new and maintain and enhance existing partnerships with other water resource users such as Public Service of New Hampshire, Essex Hydro, Consolidated Hydro, Inc. etc.

2.D.1. Establish an advisory group to the Policy Committee consisting of other water resource users.

Strategy 3. Continue to develop and implement educational and outreach activities to promote anadromous fish restoration.

3.A. Continue to implement the interim Domestic Broodstock Sport Fishery as a byproduct of the overall program to restore salmon to the river.

3.A.1. Continue to utilize domestic broodstock for the Domestic Broodstock Sport Fishery such that the harvest objective of 1,000 fish (includes fish caught and released) can be achieved.

- Expand the sport fishery as appropriate to enhance recreational opportunities and economic benefits for the program as well as economic opportunities for local towns.
- Continue to promote angler ethics through the broodstock fishery program.

3.A.2. Expand the role of the Sport Fishery Advisory Board to serve not only as a liaison between anglers and the Policy Committee but to assist the Committee with public involvement and advocacy for the restoration program.

3.B. Expand a coordinated Adopt-a-Salmon Family program as an educational effort to reach people throughout the watershed.

3.C. Continue working with the Amoskeag Fishways Partnership in order to promote the anadromous fish restoration program and aquatic ecosystem management in the watershed.

3.D. Integrate existing outreach activities with other programs in the watershed, including but not limited to the Atlantic Salmon Federation, Trout Unlimited, Natural Resource Conservation Service and local conservation commissions, Merrimack River Initiative, and Gulf of Maine Project.

3.E. Work with the appropriate organizations in developing the outreach contact center in Lawrence, MA.

3.F. Develop an anadromous fish program hot-line for the Merrimack River.

3.G. Develop an active outreach program for the dissemination of information to the media.

3.H. Provide educational and outreach materials to program volunteers.